

Amendments to the Specification

- 1) Please insert the following subtitle at page 1, below the title:

Background

- 2) Please delete the text found at page 1, lines 2 – 5.

- 3) Please insert the following subtitle and text at page 4, line 1:

Summary

The present invention relates to a method for producing synthesis gas, comprising a reforming step in a catalytic ceramic membrane reactor (RCMC).

- 4) Please insert the following subtitle and text at page 4, line 19:

Brief Description of the Drawings

For a further understanding of the nature and objects for the present invention, reference should be made to the following detailed description, taken in conjunction with the accompanying drawings, in which like elements are given the same or analogous reference numbers and wherein:

- Figure 1 illustrates a schematic representation of a method for simultaneously producing, from natural gas, both high purity hydrogen and a hydrogen/carbon monoxide mixture;
- Figure 2 illustrates a schematic representation of one embodiment, according to the present invention, of a gas treatment method incorporating a preheating furnace and a combustion chamber;
- Figure 3 illustrates a schematic representation of one embodiment, according to the present invention, of a gas treatment method incorporating a preheating unit and an associated gas turbine;
- Figure 4 illustrates a schematic representation of a second embodiment, according to the present invention, of a gas treatment method incorporating a preheating unit and an associated gas turbine;
- Figure 5 illustrates a schematic representation of a third embodiment, according to the present invention, of a gas treatment method incorporating a preheating unit and an associated gas turbine; and
- Figure 6 illustrates a schematic representation of one embodiment, according to the present invention, of a gas treatment method incorporating a preheating unit which uses a waste gas from an associated air separation unit.

- 5) Please insert the following subtitle and text after the above-inserted paragraphs:

Description of Preferred Embodiments

The present invention relates to a method for producing synthesis gas, comprising a reforming step in a catalytic ceramic membrane reactor (RCMC).

- 6) Please replace the paragraph which begins at page 7, line 11, and ends at page 8, line 32, with the following text:

The heating gas used is preferably the waste gas or gases generated by the modules for downstream treatment of raw synthesis gas which can be supplemented by modules using synthesis gas, and/or any fuel available near the unit.

- according to one particular embodiment, the initial oxygenated gas is all or part of the combustion gas available at the outlet of a gas turbine present on site, under a pressure lower than ~~2×10^{16} Pa (absolute)~~ 2×10^5 Pa (absolute), and at a temperature between 500 and 600° C.
- according to another variant of the invention, the oxidizing mixture supplied to step (b) is all or part of the combustion gas available at the outlet of the combustion chamber of a gas turbine associated with the unit, under a pressure between ~~20 and 50×10^6 Pa abs~~ 20 and 50×10^5 Pa abs and at a temperature between 1100 and 1300° C.
- advantageously, the depleted mixture issuing from step (b) is supplied to the gas turbine for the cogeneration of electrical energy.
- advantageously, the depleted mixture at the outlet of the gas turbine is supplied to the preheating furnace.
- advantageously, the pre-reformed hydrocarbon mixture is supplied to step (b) at a pressure differing by not more than 10% from the pressure of the oxidizing mixture supplied to said step (b).
- according to another variant of the invention, the oxidizing mixture supplied to step (b) is formed by all or part of a first combustion gas available at the outlet of a first combustion chamber supplied with a first fraction of combustible gas and with a first oxygenated gas, for example the combustion air available at the discharge of the air compressor of an associated gas turbine.
- advantageously, the oxidizing mixture is available under a pressure between ~~20 and 50×10^6 Pa abs~~ 20 and 50×10^5 Pa abs and at a temperature between 871 and 1100° C.

- advantageously, the pre-reformed hydrocarbon mixture is supplied to step (b) at a pressure differing by not more than 10% from that of the oxidizing mixture.
- advantageously, the depleted mixture issuing from step (b) is mixed with the unused portion of the first combustion gas to feed a second combustion chamber also supplied with a second portion of combustible gas.
- advantageously, the second combustion gas issuing from the second combustion chamber is available under a pressure between ~~20 and 50 × 10⁵ Pa~~ 20 and 50 × 10⁵ Pa and at a temperature between 1100°C and 1300°C, independent of the operating temperature of the RCMC.
- the second combustion gas issuing from the second combustion chamber is preferably expanded in the gas turbine to generate electricity.
- the combustion gas issuing from the gas turbine is advantageously supplied to the preheating furnace.
- according to another variant of the invention, the initial oxygenated gas is all or part of the waste gas from a unit producing nitrogen from air, containing 25 to 40 molar % of oxygen, available under a pressure above 1.6×10^5 Pa abs and at ambient temperature.

7) Please delete the text found at page 8, line 33, through page 9, line 23.

8) Please replace the paragraph found at page 15, line 14, with the following text:

Figure 6 shows a variant of the preheating unit in which the air supplied to the synthesis gas production unit is oxygen-enriched air, and is in particular the waste gas from a nitrogen production unit, containing between 25 and 40 molar % oxygen. This enriched air, or enriched primary air, is preferably made directly available at a pressure above ~~1.6×10^5 Pa abs~~ 1.6×10^5 abs. It is preheated to about 450°C in the preheating furnace 501, is then superheated in a combustion chamber 502 to a temperature preferably of about 1000°C by direct combustion of heating gas, preferably consisting of waste fuel from the PSA module and make-up heating gas available on site and thus forms the oxidizing mixture MO.

9) Please insert the following paragraph at page 16, line 18:

It will be understood that many additional changes in the details, materials, steps and arrangement of parts, which have been herein described in order to

explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended claims. Thus, the present invention is not intended to be limited to the specific embodiments in the examples given above.

- 10) Please replace the subtitle at page 17, line 1, with the following text:
CLAIMS What is claimed is: